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THE PHILIPPINE ISLANDS

RICE

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RICE IN THE PHILIPPINES

By H. O. JACOBSON, *Chief, Division of Agronomy, Bureau of Agriculture*

RICE, the staple food crop of the Philippine Islands, is grown in every province. The prevailing system is single cropping with little or no attempt to restore the fertility of the soil.

In most sections but one crop is produced annually, taking advantage of the heavy periodic rainfall. In a few restricted areas, favored with a more evenly distributed rainfall, and by the aid of irrigation, two crops per annum are grown.

Primitive cultural methods predominate, yet interest in modern methods is showing a healthy growth.

The crop is produced almost wholly by operators handling small areas.

Soils.—Rice is grown successfully on almost all of the soil types in these Islands. The important requisite is a heavy clay subsoil which prevents the loss of soil water by seepage and percolation.

The better rice soils contain not less than 40 per cent of clay (less than 0.00007874 inch in diameter) and 20 per cent fine silt (0.0003937 to 0.00007874 inch in diameter).

Naturally, the rice fields are most common in the level areas.

Climate.—The rice crop is produced under two distinct types of climate according to geographical distribution.

One area has a distinct wet and dry season; the other area a fairly well distributed rainfall. However, the bulk of the crop is produced in the region having the former type of climate.

The average rainfall in this region for the five months, June to October, inclusive, amounts to 61 inches.

Cropping methods.—These do not differ much from those obtaining throughout the Orient.

The most primitive method is known as *caiñgin* (ka-ing-een). During the dry season the underbrush is cut down and, when dry, burned. Then the larger trees are cut down and likewise burned. When the rains begin the rice is planted, by making a hole in the soil with a pointed stick, dropping several grains therein, and covering with soil. A second crop is not planted until several seasons have elapsed, when the process is repeated.

Rice paddies in the Mountain Province.

Another method is known as "secano," or upland. The soil is plowed and harrowed during the dry season, and the seed sown broadcast or in shallow furrows at the advent of the rainy season. Weeds are removed by hand. This system is practiced on hilly lands and no water-retaining dikes are provided.

A third method, "sabog" or "pangas," is practiced in areas where water-retaining dikes have been provided. The soil is puddled, i. e., plowed

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and harrowed until the soil is of the consistency of gruel. The seed is scattered broadcast, and water is provided, if available, in sufficient amounts to maintain a submerged condition of the field after the plants have acquired sufficient growth. If rains fail the crop suffers.

The method known as "tanim" or "tubigan" (lowland transplanting) is employed in producing approximately 80 per cent of the annual crop.

Harrowing.

A seed bed or nursery is provided in which the seed is sown very thickly, requiring from 17 to 35 bushels per acre.

The fields are plowed and harrowed while saturated with water and puddled. When the seedlings are about 6 weeks old, or older, they are transplanted by hand into the fields in hills spaced from 4 to 10 inches apart. Several plants are set in each hill. Women and children do much of this work. The "gang" organization is popular and often music is provided as a means for speeding the movements of the transplanters. Weeds are removed by hand and in some places irrigation supplements the natural rainfall.

A given number of persons can set out a larger area than it can harvest.

There are also minor variations in the practice of all the methods indicated.

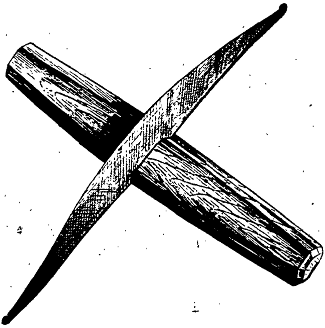
One of the most interesting features of the rice-growing industry as found in the Philippine Islands is the system of terracing practiced in the Mountain Province by the non-Christian tribes.

Transplanting rice.

As shown in an accompanying illustration, the entire mountain side has been converted into a series of rice paddies. It is believed that the examples of engineering as exemplified there are superior in workmanship to any similar feature elsewhere, both in extent and quality. When the very primitive means by which this work has been accomplished are considered, modern feats of agricultural engineering by the aid of the most modern instruments and machinery appear to be less marvelous.

Harvesting.—There is less diversity in harvesting methods than in cultural methods.

Large areas are harvested by cutting the ripened heads one by one, or at the most three at a time, with an implement called "pañgani" or "yatab". This implement is preferred by women, children, and aged men.



"Pañgani" or "yatab," used for cutting single heads of rice.

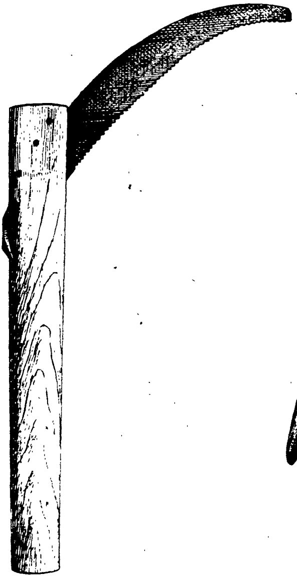
A small sickle ("karit") is used when the crop is to be bound into small "hands" or sheaves, and an instrument called "singcaw" is used for the same purpose. This tool is used by men mostly and with it an industrious laborer working in a normal crop can cut and bind 360 sheaves per day, or about 10 bushels of rough rice.

Harvesting is done largely on a crop-share basis, the laborers receiving from one-tenth to one-fourth of the crop for their service, the percentage varying with the labor supply.

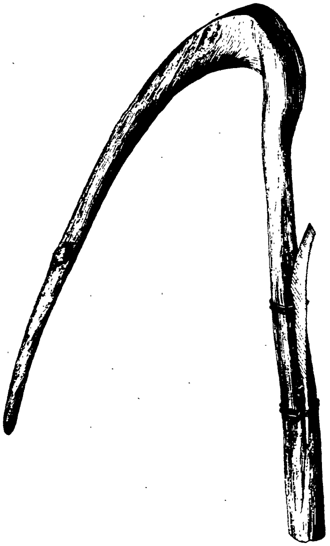
Threshing.—To supply immediate home demands part of each crop is immediately threshed, sun dried, and hulled. The main crop is stacked in a very excellent manner, as a rule.

Threshing is still done in most places by various simple means such as treading on a hard earthen floor by human beings or carabaos, treading on slatted platforms, and by beating with flails or against stones or hard wooden boards.

Modern American threshing machinery has become quite popular, there being not less than 130 outfits in the Islands. Threshing is also done on a crop-share basis.



"Karit," or native sickle.

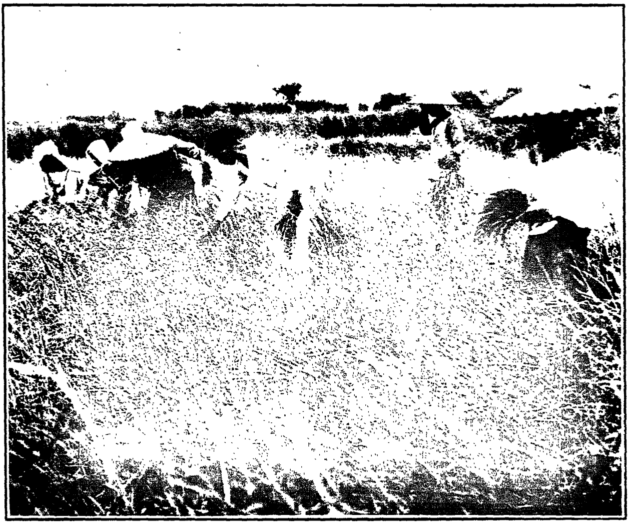


"Singcaw," or hook and sickle combined.

Hulling.—Large quantities of rough rice are hulled with homemade mortars and pestles, or heavy wooden mallets called "mazos." There are also homemade power-driven machines and a considerable number of modern mills. Modern machinery is gradually superseding the old-fashioned sort.

Also, most of the locally produced rice is not highly polished and in the southern half of the Archipelago practically none is polished.

Varieties.—In common with other Oriental rice-producing countries, the Philippine Islands have a great wealth of varieties. The Bureau of Agriculture has studied more than 1,000 varieties. These have been classified into groups as to suitability for growth under upland or lowland conditions, as to bearded or nonbearded, and as to color and composition of kernel.



Rice harvesting.

Varieties vary in color of kernel from the semi-transparent white to the deep, purplish black. This color variation also applies to the hulls.

Certain varieties have been found particularly adapted to special uses and for peculiar conditions. In fact, the great diversity of varieties is not easily comprehended. At the present time the division of agronomy has on file 3,500 variety names.

Production.—The local production of rice for a five-year period is given below:

Fiscal year—	Area cultivated.	Yield of rough rice.	Yield per acre.	Total value on the farms.
	Acres.	*Bushels.*	*Bushels.*	*Dollars.*
1909	2,856,735	37,019,249	13.0	26,177,994
1910	2,945,780	40,137,321	13.6	27,882,925
1911	2,579,124	43,693,690	16.9	30,897,795
1912	2,665,939	24,735,808	9.3	19,990,644
1913	2,820,009	52,140,307	18.5	28,969,900

Prior to the eighties there was a surplus production of rice so that it entered into the list of exports, but since that time importations have been necessary to meet the home demand.

The development of the sugar and hemp industries has encroached upon the labor supply available for rice production, as has also the demand for labor for railway building and public works. Besides, there has been a considerable movement of the rural population to the larger centers.

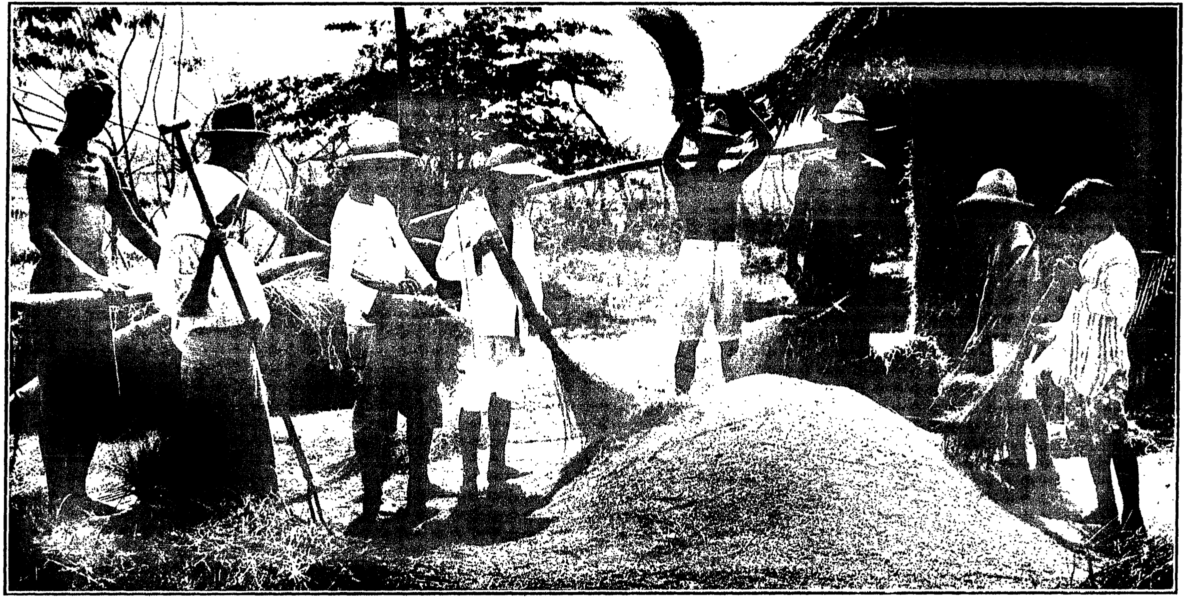
Another highly important factor is the lack of work animals, dating back to the great losses from disease in the nineties.

Cost of production.—Little data is available on this subject as yet, but an estimate published in 1912 by the Bureau of Agriculture for lowland transplanted rice is conservative:

Estimated cost of growing one acre of rice

Preparing of seed beed (nursery)	$0.46
One bushel seed	.59
Plowing 1 acre, 1 man and carabao 4 days, at $0.625 per day	2.50
Harrowing and fitting, 1 man and carabao 3¼ days, at $0.625 per day	2.03
Transplanting, 8 women and children, at $0.20 per day	1.60
Cost of harvesting and threshing	4.29
Total	11.47

In spite of the fact that the margin of profit in rice growing is small, it will probably continue to be one of the most important crops.

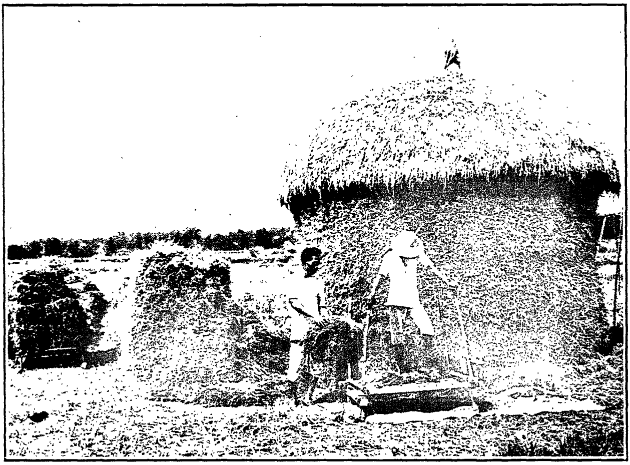


Threshing rice by beating.

The crop is most suitable for certain large areas of land, has no substitute for the rainy season in those places, and utilizes much labor which would otherwise secure no compensation or utilization.

Furthermore, there is not any single food crop which can replace it for the Tropics.

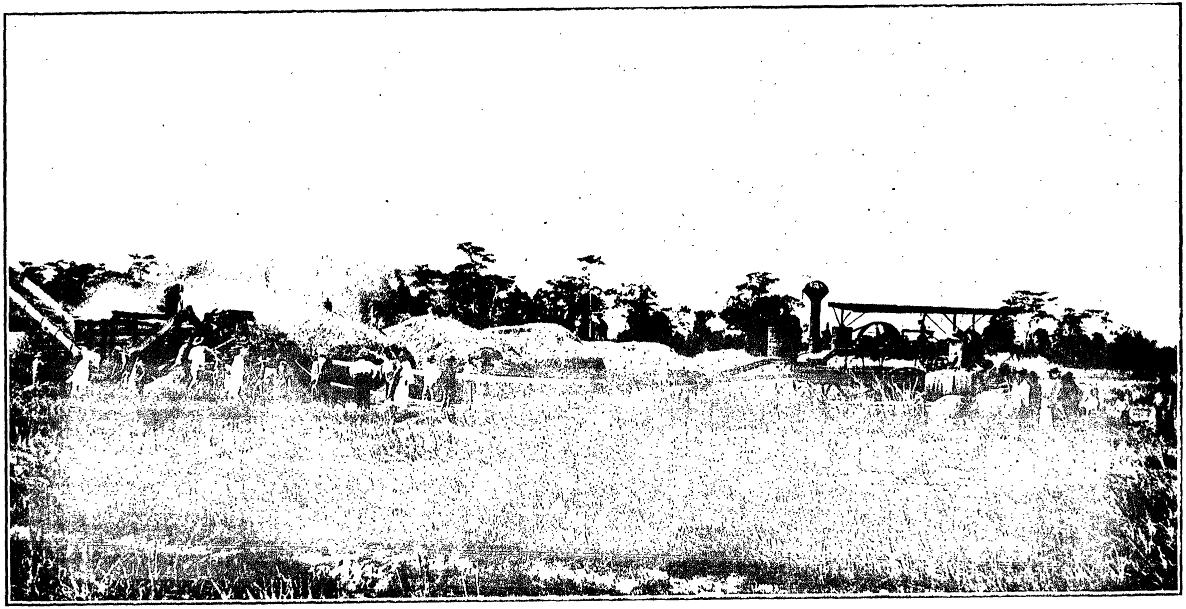
Transportation.—The locally produced crop is very largely consumed by those who produce it. The surplus does not move very far from its place of production. Consequently there is a growing tendency to locate the rice mills at or near centers that produce a surplus.



Threshing; slatted platform.

The five provinces, Pangasinan, Nueva Ecija, Bulacan, Pampanga, and Tarlac lie north-northwest from Manila, two of these provinces abutting on Manila Bay. These provinces contain about one-third the rice-growing area and produce nearly one-half the annual crop. Thus the center of production is very close to the center of population.

A railroad runs from Manila through this rice region, both ends terminating at seaports.



Modern rice thresher.

Imports.—To supply the additional demand for rice, importations have constantly been made during the past thirty-odd years. The volume of annual importations varies greatly according to the condition of the Philippine crop.

During the period 1909 to 1913, inclusive, these importations were as follows:

Importation of cleaned rice, 1909–1913

Fiscal year—	Tons.	Value.
1909	151,764	$4,250,223
1910	203,508	5,321,962
1911	223,860	6,560,630
1912	286,876	10,569,949
1913	197,539	7,940,857

All imported rice pays an entry duty of 1 cent per kilo (2.20462 pounds).

Consumption.—The following table indicates the annual total consumption of cleaned rice:

Fiscal year—	Produced.		Imported.		Total consumption.
	Value.	Quantity.	Value.	Quantity.	
		Tons.		*Tons.*	*Tons.*
1909	$27,955,661	536,861	$4,250,223	151,764	688,625
1910	30,310,323	582,080	5,321,962	203,508	785,588
1911	32,995,971	633,655	6,560,630	223,860	857,515
1912	21,152,791	358,724	10,569,949	286,876	645,600
1913	30,868,561	756,149	7,940,857	197,539	953,688

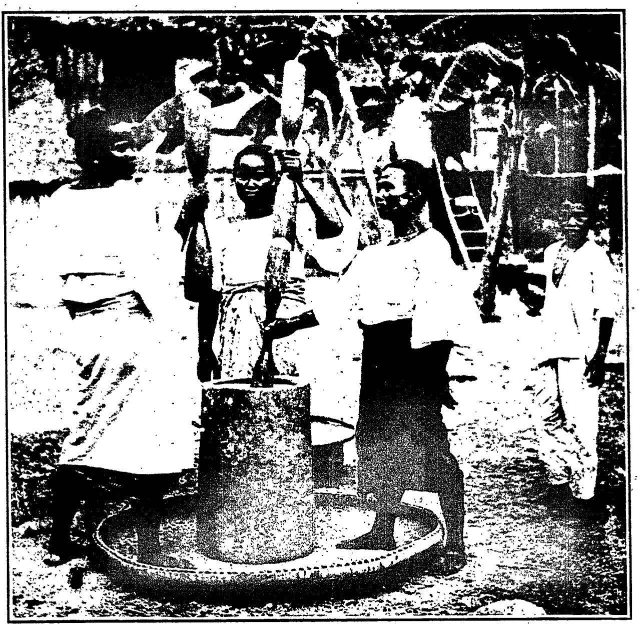
It is estimated that this year (1915) 1,000,000 tons of rice will be required for local consumption in the Philippines.

Uses.—Of course, the main use is for food. The Filipino can cook rice very skillfully and perfectly. Americans in the Philippines have been agreeably surprised to learn that rice cooked and served without any other material is a very satisfactory article of diet.

The favorite method is to place the rice and cold water in an unglazed pot and cook the rice until the water is absorbed and evaporated. The rice then comes out unbroken and somewhat firm. Rice which becomes pasty soon after being cooked is not considered to be desirable.

Rice is also utilized for making alcohol and beverages.

In the Mountain Province red rice is used for making a fermented drink (wine) known as "tapuy." The coloring matter in the cuticle being dissolved in the alcohol produced by fermentation imparts a reddish color to this drink.

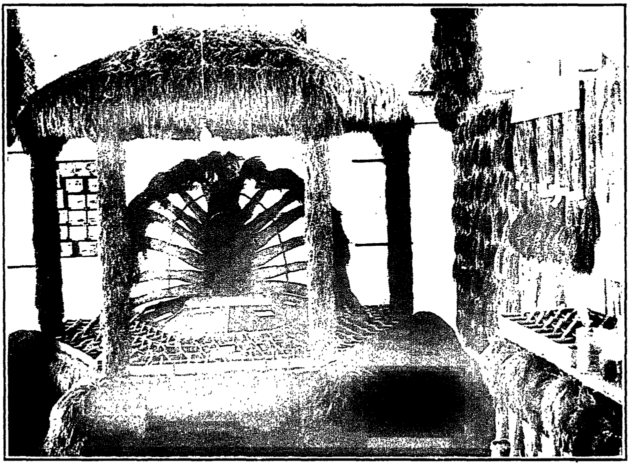


Hulling rice.

Glutinous rice is employed in preparing certain fancy dishes and pastries.

Popped rice has evidently been known here for some time. This is prepared from the rough rice, which is placed in a heated iron pan or a vessel containing heated sand; the grains pop open and then the hulls, sand, etc., are removed by sifting. Molasses is mixed with the popped rice and cakes are then molded into sizes and shapes suitable for the retail trade.

By-products.—In the milling process two principal by-products are produced, "tiki-tiki" (rice bran), and "binlid" (broken rice). Tiki-tiki is utilized mainly as stock food, while binlid is used for human consumption, stock food, and for distilling purposes. The rice straw is utilized but little in industries, the greater part of it being left in the field at harvest time, and subsequently burned or plowed under.



Rice booth, Second Philippine Exposition.

Prospects.—The Bureau of Agriculture, as a result of its investigations, is carrying out an aggressive campaign in educating the rice growers in the proper selection of seed. Proper seed selection, when practiced, will have a powerful influence on the volume of the annual crop. The gradual increase in the number of work animals tends to result in increasing the area planted with rice. The extension of irrigation, if continued, is a form of crop insurance especially valuable in rice farming and while there are about 125,000 acres under irrigation at present, there are at least 1,250,000 acres that may be brought under modern irrigation.

As yet there are no serious pests affecting the rice crop which are not controllable.

Further information on this subject may be obtained from the director-general of the Philippine Exposition Board, Panama-Pacific Exposition, or by application to the Director of Agriculture, Manila, P. I.